

## CHARLES G. BOERNER.

We regret to have to announce the death of one of our most esteemed voluntary observers, Mr. Charles G. Boerner, at Vevay, Ind., in the seventy-third year of his age.

In the summer of 1867 the Editor began the organization of a system of meteorological stations in connection with the work of the astronomical observatory at Cincinnati, Ohio, and at this time received a visit from Mr. Charles G. Boerner, of Vevay, Ind., who was already known to him as a skillful horologist and a faithful meteorological observer. We learn that Mr. Boerner was born in the village of Artern, in Prussian Saxony, on April 14, 1827. His father, Charles G. Boerner, was a graduate of the University of Halle, and a watch manufacturer at Artern. The son, Charles, Jr., graduated at Erfurt, became an expert watchmaker, and was for a year assistant at Dresden Observatory. In 1847 he came, with his parents, to Detroit, Mich., but in 1849 settled in Cincinnati, and in 1864 moved to Vevay and went into business with his brother.

Mr. Boerner was a Fellow of the American Association for the Advancement of Science, and an active member of the Cincinnati Society of Natural History. He began his system of meteorological observations for the Smithsonian Institution in November, 1864, and continued them as a voluntary observer of the Weather Bureau. With the assistance of the members of his family this record has been continuous up to the present time, and his daughter, Miss Frederica Boerner, will maintain it for the future. His work has always been distinguished for extreme neatness and accuracy, and the numerous special observations and notes recorded by him show a wide appreciation of many aspects of meteorology. His complete record for thirty-five years in one location has made Vevay one of the climatological centers of the United States. His library and geological collections show fine taste and broad intellectual sympathies. Mr. Boerner was married in 1853 and leaves a wife and five children. He enjoyed the highest esteem of every member of the community. He was active in every good work and his place will not easily be filled.

## ARTIFICIAL RAIN.

The question perpetually arises in the popular mind as to whether man can not produce rain or drought according as his needs may dictate. The possibility of doing this is never questioned by barbarians, who have their professional rain makers and great medicine men, and superstitiously attribute to them all power over nature. In some parts of the Christian world it has been believed that man could bring about rain or drought, not by his own power, but by intercession with the Creator, who would, perhaps, work a miracle on his behalf. During the past thousand years miracles have been confessedly rare, and some consider it almost impious for man to dare to interfere with the operations of nature on a large scale; some even refuse to be doctored for disease.

The recognition of the truths revealed by modern science has made it evident that man can affect the weather only by understanding and making use of the laws of nature. He must do it in a natural or scientific way, not through any supernatural power or in any miraculous way. In fact, those who have a very imperfect knowledge of the laws of nature, if any at all, are often inclined to believe that there really must be some process known to science, or still to be discovered, by which man can bring abundant rain from the clouds when and where he needs it. They point to the popular belief that rain follows great battles, as proving that there is some way by which to affect the clouds—it may be through the noise

of the battle, or it may be the burning of the gunpowder, or it may be a possible electric disturbance. They point to the reputed influence of lightning rods, which are supposed to draw the lightning from the skies and prevent the formation of hail.

In these and other matters there is abundant room for self-deception. It would be a great mistake to conclude that any battle by reason of its noise, or heat, or gunpowder has had any effect in the way of producing rain, or that the lightning rods have had any effect in producing or preventing hail. The statistics that are supposed to substantiate such conclusions do not really prove anything of the kind, and yet many are deceived by them because in reasoning upon the phenomena of nature they forget to apply the simplest laws of logic, and are carried away by emotions or preconceived opinions or the plausible suggestions of others. This is not at all singular, for the history of man's progress in knowledge is the history of a long series of mistakes covering thousands and tens of thousands of years. All have to learn by bitter experience, and if science seems to have made rapid progress during the past century, that should not blind our eyes to the fact that errors may still prevail among the professional scientists as well as the rest of mankind.

In the special matter of the artificial formation of rain we heartily indorse the statement that if it is in any way possible to bring this about we must labor to discover it; in fact, we eventually shall discover the way, if there be one, but thus far nothing has been accomplished to justify us in believing that feasible methods exist or are likely to exist. Various methods have had their advocates both in Europe and America, and the citizens of the United States, with a nervous energy that is greatly to be admired, have given a full and fair trial, at great expense, to several methods advocated by men of imperious natures that would brook no denial short of nature's own experimental demonstration of their errors. Thus the rain-making by explosives was most thoroughly tested by order of Congress at an expense to the public of many thousands of dollars, and the results have been discussed sufficiently, both in public and private, to show that nothing in the way of rain, and probably nothing in the way of cloud or mist was produced. One of the first experimental trials was made quite near Washington, D. C., at nighttime November 2-3, 1892, when a series of clouds with showers were passing over the neighboring country, and these continued right along for several hours quite independent of the bombardment. The reports from numerous observers showed that as the showers moved along over the earth's surface those in front of it reported that the noise of the exploding dynamite occurred just before the shower; those in the wake of the shower reported that the shower came before the explosion, while those in the midst of the shower, of course, heard the explosion while it was raining. There was no evidence that the explosion had any effect on the clouds. The present writer took careful observations in Washington, D. C., during the whole of this first experiment, and has also studied the subsequent experiments with explosives sufficiently to feel warranted in saying that no rainfall was produced by bombardment.

About that time we began to hear of a "famous Australian method of producing rain practised by Frank Melbourne in Australia," who was said to have recently returned home to Ohio and was experimenting in that State. Beginning at Canton, Ohio, on May 7, 1891, he subsequently went to Cheyenne, Wyo., Kelton, Utah, and was at Goodland, Kans., in October, 1891. He was known as the "rain wizard." His method consisted in locking himself in a barn, house, freight car, or other room wherein he made a fire and burned or evaporated certain chemicals, whose smoke rose through the roof out of some impromptu chimney or stove pipe and dissipated

itself in the thin air. Of course Melbourne claimed that the chemicals exerted a great influence on the atmosphere and forced rain to come. Occasionally rain did come after one, two, or three days of a chemical performance, but equally often it did not come. The cases of apparent success published in his pamphlet of April, 1892, were attested by the signatures of innumerable citizens, but these attestations, although they generally state "we believe that Mr. Melbourne has done more than he promised, and has produced the rain," yet, in fact, simply amounted to a record of the fact that rain did follow within four days from the time of his setting to work, and that "we are unable to account for it in any other way." The pamphlets published by Melbourne and the free advertisement in the newspapers produced so great a popular demand for his services in the arid regions that it really was a paying investment to hire him to attend a local fair or to "operate" in any locality. The twenty-five cents admission fee to see the "operations" were sure to cover expenses. The Weather Bureau was often importuned for advice as to when he should be called to any given town, and whether the inhabitants would be justified in paying him his fee of several hundred dollars. Eventually, a prominent railroad, through its enterprising business manager, rigged up a car for his use, and during the years 1892-4 made it convenient for all the citizens on its lines of road to invoke the aid of "the rain producer." Of course there were numerous cases in which the operations were followed by rain; those who studied the Daily Weather Map could see at a glance that these rains accorded with the general weather conditions and had nothing to do with the rain-making operations. So long as frequent rains occurred, although they were natural and were predicted by the Weather Bureau on the basis of the weather map from day to day, yet, the farmers of Iowa, Kansas, and Nebraska, ignoring this fact, were sure to accredit all success to Mr. Melbourne. Apparently, it was at first a profitable enterprise for the railroad, whose general manager wrote to us as follows in August, 1894.

The expense of the efforts has, with very rare exceptions, been our own and borne by the company. If good has resulted, the company can claim the benefit of it, and if the conditions which followed the operations would have followed them naturally, no one has been deceived except the company, because, with one or two exceptions, it has paid the bill.

Since 1894 several imitators of Melbourne's methods have occasionally been heard from. In March, 1896, Mr. W. Hazenflug, of Yates Center, Kans., was said to have patented a rain-making device—"an especially constructed gun, 14 feet long, that discharged a moisture-producing substance to a height of 18 miles and produced a shower of from 3 to 5 inches of rain within twenty-four hours at a small cost of \$6.00." America is not alone in these matters; on October 23, 1893, a prominent scientific journal of France recorded that A. Baudouin ran up a kite to a height of 1,200 metres into a cloud and produced sprinkles of rain, and that he had often thus made it rain in Tunis, Africa.

During the last great drought in California, 1898-99, the citizens of one city authorized an extensive and expensive system of experiments by gases and by cannon, but were fortunately saved the necessity of actually wasting their money by the fact that an abundant rain fell naturally just before they were ready to begin their own operations.

Occasionally we still receive newspaper items reviving the old story that floods of rain were broken up by cannonading at Rome, or that rain was produced by cannonading in Italy, or that hailstorms were averted from a special vineyard that was protected by lightning rods while neighboring vineyards suffered. These are all repetitions of the same old myths or repetitions of useless experiments, and the intelligent reader may dismiss them as having no foundation. No mat-

ter how severely his land may be suffering from drought or flood, he should seek some other mode of relief and not waste his time and money in efforts to change the nature of the clouds or the atmosphere.

In letters lately received from a gentleman in Helix, Cal., the writer says:

I have a letter from a man in Kansas, who, during five years, made 200 experiments with the discharge of gases, and declares that in 90 per cent of the cases they were successful, and his statement is fully confirmed by the assistant general manager of the railroad that lent him a traveling car, and in fact, employed him. \* \* \* Will you kindly specify what gases have been experimented with by the Government, and then I will tell you what he used. If you have thoroughly tested the same gas, then, of course, I can believe there is nothing in it. If not, then, I trust you will apply for the use of that \$5,000 that was repaid into the treasury, and have a thorough test made around San Diego. \* \* \* The present winter threatens to be another dry one, and the orchardists are in despair—it means ruin to many. The water companies say if they have to pump again they will have to charge us 10 cents for 1,000 gallons instead of 5 cents as last year. \* \* \* I only wish to be satisfied that you have entirely overlooked the tests I name (i. e. the method of the Kansas operator—Ed.) or I would give you the facts now, but your specialists having reported that *it can't be done*, are, in my opinion, biased, and will pooh-pooh every one else's tests. The man in question says he used 20 tons of chemicals; that although he failed in some places he succeeded in 90 per cent. Is it likely he would have gone on using 20 tons of chemicals at his own cost, if it was a dead failure? He has no motive to gain; he has made the recipe public, and why then should he lie about it? \* \* \* The reason why nothing is heard of this man's success is obvious. As most people get all the rain they want the public does not concern itself about the matter.

The honest indignation of our correspondent at the supposed shabby official treatment of a man in Kansas who has thus greatly and generously benefited his countrymen can best be met by the above given public statement of the simple facts of the case as learned by the present writer at the time of their occurrence, and we publish them for the benefit and guidance of all. It is not necessary for the Weather Bureau to try Mr. Melbourne's chemicals. He himself and his railroad company did that for us to perfection. The full official statement of his results day by day during May, June, July, and August, 1892, are now before us, and justify the statement that rain followed when the weather conditions were favorable for rain and when the local Weather Bureau man, with the weather chart before him, would have predicted local rains, such as occur in the summer time, without any regard to the chemical operations. Moreover, our correspondent may rest assured that the twenty tons of chemicals and other expenses were paid for by the railroad company, as shown by the above quotation from the letter of the general manager, probably until it was found that the company was losing too much money by the operation, and perhaps also a little self respect in perpetuating the delusion.

We may add further that if the Kansas recipe of chemicals appropriate to the production of rain is known to our correspondent at Helix, and if he and his neighbors wish to try the experiment during the next season of drought, there is certainly no reason why they should not do so. It seems absolutely necessary that the experiment should be tried over and over again, generation after generation, in order to show its folly to those who can only be guided by their own personal experience

#### THE WEATHER MAKER.

In connection with the preceding, the Editor recalls the following passage in an interesting book by E. Gerard, published in New York in 1888, entitled *The Land beyond the Forest*, which gives an account of the natives of Transylvania. As many of those now living in the United States have emigrated from countries whose inhabitants still retain beliefs in these stories of the old world, it is not surprising that we